

Patent Claims

1. Method for aligning bank notes in a transport system, with the following steps:

- detecting the alignment of a bank note transported separately in the transport system,
- checking the detected alignment of the single bank note as to the presence of a misalignment,
- aligning the single bank note in a desired alignment by a movement of the single bank note in a direction deviating from the transport direction of the transport system using the detected misalignment,

characterized by

- detecting the alignment of the single bank note during the aligning, and
- terminating the aligning, as soon as the single bank note has the desired alignment.

2. Method according to claim 1, characterized in that the distance of the single bank note from a bank note located in front of it in the transport system and/ or to a bank note located after it in the transport system is determined and the single bank note is slowed down and/ or stopped, so as to achieve a predetermined distance between the single bank note and the bank note located in front of it and/ or after it in the transport system, if the determined distance does not correspond to the predetermined distance.

3. Apparatus for aligning bank notes in a transport system (10;11), with

- a device for detecting the alignment (20) of a bank note (BN) transported separately in the transport system (10; 11),
- a device for checking the detected alignment (21) of the single bank note (BN) as to the presence of a misalignment,

- means for aligning (22 to 25; 22, 23, 26; 40 to 49) the single bank note (BN') in a desired alignment, which are controlled by the device for checking the detected alignment (21) using the detected misalignment, characterized in that
  - the device for detecting the alignment (20) detects the alignment of the single bank note (BN') in the area of the means for aligning (22 to 25; 22, 23, 26; 40 to 49), and
  - the device for checking the detected alignment (21) stops the means for aligning (22 to 25; 22, 23, 26; 40 to 49), as soon as the single bank note (BN') has the desired alignment.
- 4. Apparatus according to claim 3, characterized in that the device for detecting the alignment (20) detects a two-dimensional area.
- 5. Apparatus according to claim 3 or 4, characterized in that the means for aligning (22 to 25; 22, 23, 26) mechanically act on the single bank note (BN').
- 6. Apparatus according to claim 5, characterized in that the means for aligning (22 to 25; 22, 23, 26) have at least one roller (23; 24), which aligns the single bank note (BN') by a movement in a direction deviating from the transport direction (T) of the transport system (10; 11).
- 7. Apparatus according to claim 5 or 6, characterized in that the means for aligning (22 to 25; 22, 23, 26) at least have one component (22; 25), which removes the means for aligning (22 to 25; 22, 23, 26) from the single bank note (BN').
- 8. Apparatus according to claim 3 or 4, characterized in that the means for aligning (40 to 49) act on the single bank note (BN') in a non-contacting fashion.
- 9. Apparatus according to claim 8, characterized in that the means for aligning (40 to 49) at least produce one air flow (41 to 44), which aligns the single

bank note (BN') by a movement in a direction deviating from the transport direction (T) of the transport system (10; 11).

10. Apparatus according to one of the claims 3 to 9, characterized in that the device for detecting the alignment (20) and the device for checking the detected alignment (21) detect and determine the distance between the single bank note (BN') and a bank note (BN'') located in front of it in the transport system (10; 11) and/ or a bank note (BN) located after it in the transport system (10; 11), and that a device (30, 31), controlling the device for checking the detected alignment (21), slows down and/ or stops the single bank note (BN'), so as to achieve a predetermined distance between the single bank note (BN') and the bank note (BN'' and/ or BN) located in front of it and/ or after it in the transport system (10; 11), if the determined distance does not correspond to the predetermined distance.
11. Apparatus according to claim 10, characterized in that the device (30, 31) for slowing down and/ or stopping the single bank note (BN') mechanically acts on the bank note.
12. Apparatus according to one of the claims 1 to 11, characterized in that the transport system (10; 11) has a guiding element (15), against which the single bank note (BN') is directed by the means for aligning (22 to 25; 22, 23, 26; 40 to 49), the guiding element (15) having the desired alignment.
13. Apparatus according to one of the claims 1 to 12, characterized in that the apparatus and the transport system are components of an automatic counter for receiving bank notes.
14. Apparatus according to one of the claims 1 to 12, characterized in that the apparatus and the transport system are components of a bank-note processing machine for counting and/ or checking and/ or sorting bank notes.